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REMARKS

The Examiner has stated without comment in the footnote: at page 4 of the Rejection mailed 7/28/04 "See Ex parte Remark, 15 USPQ 2d 1498, 1500 (BPAI 1990); Ex parte Kristensen, 10 USPQ 2d 1701, 1703 (BPAI 1989); Ex parte Attig, 7 USPQ 2d 1092, 1093 (BPAI 1988); and Ex parte Copenhaver, 109 USPQ 118 (POBA 1955). " Applicants have addressed the holding of these decisions in pages 106-108 of applicants response dated 03-01-2004 - received by USPTO 03-03-2004 entitled "Fifth Supplementary Amendment" in which applicants have given extensive reasons why these decisions do not apply in the present application. The Examiner has provided no rebuttal of these comments. The Examiner has made no attempt to satisfy the Examiner's burden that one of ordinary skill in the art would not understand the objected to terms. Thus the Examiner has not made a prima facie case of indefiniteness and the rejections for indefiniteness should be reversed. In addition to the extensive evidence applicants have submitted to show that the USPTO does not follow a rule that claim terms which are combinations with the words "type" and "like" are per se indefinite applicants have stated in applicants' SECOND SUPPLEMENTAL AMENDMENT submitted March 8, 2005 applicants state in the paragraph bridging pages 22 and 23:

In Ex parte Copenhaver, the Board stated in regard to the terminology "Friedel-Graftz type" catalyst.

"[w]e are of the view that the word "type" when appended to another wise definite expression so extends the scope of such an expression as to render it objectionably indefinite from the stand point of patent law and procedures."

We are not led to a different conclusion by the fact that the expression may have been used in certain technical and scientific publications which are not subject to the rigid legal requirements for definitions that apply to patent claims. The fact that the expression may have been used in claims of certain patents likewise does not alter our view on the question."

Applicants note that Ex parte Copenhaver decided in 1955 was not cited by the Board in the later Board decisions cited by the Examiner. This decision has not been cited by any other Board or Court decision.

The undersigned attorney searched the term "Friedel Crafts type" in the claim field the USPTO patent search webpage <http://patft.uspto.gov/netahtml/PTO/search-adv.htm> which has the warning "Patents from 1790 through 1975 are searchable only by Issue Date, Patent Number, and Current US Classification." Attachment A is a printout of this page showing this warning.

The result of this search is in Attachment B which lists 32 issued US patents with the term "Friedel Crafts type" in the issued claims. A claim from each of those 32 patents is listed below. The text of these claims were copied from the USPTO web site. An additional 11 patents were found with the term "Friedel Crafts type" in the issued terms which were not identified in the search, possibly because their text fell out side of the full text search time window identified in the warning noted above. A claim from each of those 11 patents is listed below (items 33 to 43 in the list.) The term "Friedel Crafts type" is in bold, italic, underlined text to be readily identified - "***Friedel Crafts type***". It is clear that the USPTO does not consider the term "Friedel Crafts type" when used in a claim to be per se indefinite notwithstanding the decision of Ex parte Copenhaver and thus this decision does not establish a rule that claim terms which include the words "type" or "like" are per se indefinite. Therefore, the Examiner cannot reject claims as being indefinite merely because the terms include the words "type" or "like." The Examiner must provide a reason for why a person of ordinary skill in the art would not understand the meaning of such claim terms in view of the specification and what is know to a person of ordinary skill in the art. Since the Examiner has not done this, the Examiner has not made a prima facie case of indefiniteness for the claim terms used by applicant that include the words "type" or "like." Thus the rejection for indefiniteness should be withdrawn.

Since the evidence submitted herein is data from the USPTO website the information that the Examiner is deemed to be aware or since it is evidence of standard USPTO practice.

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PATENT AND CLAIM LIST

1) US 5,196,630

1. A process for the removal of halogen-containing catalytic residues from olefin polymerization products comprising:

(a) admixing an olefin polymerization product with a quantity of a quaternary ammonium salt, having the structural formula

wherein R is alkyl, aralkyl or alkaryl and X is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine, effective to facilitate the removal of greater than 80% of contaminating halogen-containing *Friedel-Crafts type* or Ziegler-type catalytic residues upon subsequent washing with aqueous solution and separation of the aqueous phase;

(b) washing the mixture of step (a) with an aqueous washing solution;

(c) allowing the washed solution of step (b) to settle for a period of time effective to cause the aqueous and organic phases to separate; and

(d) separating the aqueous phase from the organic phase to provide an organic phase that is substantially free of contaminating catalytic residues.

2) US 5,196,607

1. A process for preparing the (4S)-enantiomer of 4-(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone in a highly optically-pure form, starting from 3,4-dichlorocinnamyl chloride, which comprises the sequential series of steps that involve:

(a) first reacting 3,4-dichlorocinnamyl chloride with at least an equimolar amount of L-(-)-ephedrine in a chlorinated lower hydrocarbon solvent at a temperature ranging from about -20.degree. C. up to about 25.degree. C. to form the corresponding chiral N-methyl-N-(.beta.-hydroxy-.beta.-phenylisopropyl)-3-(3,4-dichlorophenyl)propanoamide;

(b) subjecting the chiral unsaturated amide product obtained in step (a) to a Grignard reaction with a large excess in moles of phenyl magnesium chloride or bromide in a cyclic or lower dialkyl ether at a temperature ranging from about -80.degree. C. up to about 25.degree. C., followed by hydrolysis, to effect a conjugate addition of the phenyl group and the hydrogen element to the aforesaid .alpha.,.beta.-propanoamide and so selectively form the corresponding chiral N-methyl-N-(.beta.-hydroxy-.beta.-phenylisopropyl)-3-(3,4-dichlorophenyl)-3-phenylpropanoamide;

(c) hydrolyzing the aforesaid chiral 3-phenylated propanoamide product of step (b) in a lower

alkylene glycol solvent in the presence of an alkali metal hydroxide as base to form the corresponding 3-(3,4-dichlorophenyl)-(3R)-phenylpropanoic acid;

(d) esterifying the stereospecific (3R)-phenylated propanoic acid obtained in step (c) with an appropriate lower alkanol in the presence of thionyl chloride or a lower alkanoyl chloride to form the corresponding lower alkyl 3-(3,4-dichlorophenyl)-(3R)-phenylpropanoate;

(e) reducing the stereospecific (3R)-phenylated propanoic acid ester of step (d) with an appropriate carbonyl reducing agent in a reaction-inert polar aprotic organic solvent at a temperature ranging from about 0.degree. C. up to about 100.degree. C. until the reduction to form the corresponding desired 3-(3,4-dichlorophenyl)-(3R)-phenylpropanol intermediate is substantially complete;

(f) chlorinating the stereospecific phenylated n-propanol compound obtained in step (e) with carbon tetrachloride in an excess of said reagent as solvent and in the presence of triphenylphosphine at a temperature ranging from about 50.degree. C. up to about the reflux temperature of the reaction mixture to form the corresponding 3-(3,4-dichlorophenyl)-(3R)-phenylpropyl chloride;

(g) reacting the stereospecific (3R)-phenylated n-propyl chloride obtained in step (f) with an alkali metal cyanide in a reaction-inert polar organic solvent at reflux temperatures to form the corresponding 4-(3,4-dichlorophenyl)-(4R)-phenylbutyronitrile;

(h) hydrolyzing the stereospecific (4R)-phenylated butyronitrile product of step (g) in a lower alkylene glycol solvent in the presence of an alkali metal hydroxide as base to form the corresponding 4-(3,4-dichlorophenyl)-(4R)-phenylbutanoic acid; and

(i) thereafter converting the stereospecific (4R)-phenylated n-butanoic acid compound obtained in step (h) to the corresponding 4-(3,4-dichlorophenyl)-(4R)-phenylbutanoyl chloride by treatment with thionyl chloride in a reaction-inert aprotic organic solvent, followed by cyclization of the aforesaid butanoyl chloride compound in the presence of a *Friedel-Crafts type* catalyst at a temperature ranging from about -5.degree. C. up to about 25.degree. C. to finally yield the corresponding (4S)-4-(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone enantiomer in the desired isomer weight ratio in the resultant isomeric product mixture that allows for the ready recovery of said individual isomer therefrom in a highly optically-pure form.

3) US 4,918,143

1. A polyphenylene ether resin composition comprising as the major components:

(a) 100 parts by weight of polyphenylene ether resin, and

(b) 1-30 parts by weight of a hydrocarbon resin which has a softening point of 140.degree.-180.degree. C. and a ratio of weight-average molecular weight to number-average

molecular weight $M_{sub.w}/M_{sub.n}$ of 2.0 or less, and is prepared by polymerizing a raw material oil of hydrocarbon in which the total content of indene and methylindene is 80% by weight or more by the use of a Friedel-Crafts type catalyst.

4) US 4,877,916

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula ##STR15## in the presence of a reagent of the Formula ##STR16## provided that said reagent has greater electron releasing properties than said olefinic compounds,

an alkyl halide or a hydrogen halide, and

a Lewis acid,

wherein

R.sup.4, R.sup.5, R.sup.6, R.sup.7, R.sup.8, R.sup.9, R.sup.10, R.sup.11, R.sup.12 and R.sup.13, independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that

(i) R.sup.5, R.sup.6 and R.sup.7 are each other than H,

(ii) no more than one of R.sup.8, R.sup.9 and R.sup.10 are H, and

(iii) no more than one of R.sup.11, R.sup.12 and R.sup.13 are H, wherein said process is carried out in the substantial absence of elemental iodine.

5) US 4,877,915

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula ##STR15## in the presence of a reagent of the Formula ##STR16## provided that said reagent has greater electron releasing properties than said olefinic compounds, and

a Lewis acid,

wherein

R.sup.4, R.sup.5, R.sup.6, R.sup.7, R.sup.8, R.sup.9, R.sup.10, R.sup.11 and R.sup.12, independently, are substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction, provided that

- (i) R.sup.5 and R.sup.6 are each other than H,
- (ii) no more than one of R.sup.7, R.sup.8 and R.sup.9 are H, and
- (iii) no more than one of R.sup.10, R.sup.11 and R.sup.12 are H,

wherein said process is carried out in the substantial absence of elemental iodine.

6) US 4,877,914

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with one or more substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the formula ##STR10## wherein R.sup.4, R.sup.5 and R.sup.6, independently, are substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction, provided that R.sup.5 and R.sup.6 are each other than H, in the presence of

an alkyl halide,

a Lewis acid, and

a phase transfer agent.

7) US 4,877,913

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula ##STR15## in the presence of a reagent of the Formula ##STR16## provided that said reagent has greater electron releasing properties than said olefinic compounds, and

a Lewis acid, wherein

R.sup.4, R.sup.5, R.sup.6, R.sup.7, R.sup.8, R.sup.9, R.sup.10, R.sup.11, R.sup.12 and R.sup.13, independently, are substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction, provided that

(i) R.sup.5, R.sup.6 and R.sup.7 are each other than H,

(ii) no more than one of R.sup.8, R.sup.9 and R.sup.10 are H, and

(iii) no more than one of R.sup.11, R.sup.12 and R.sup.13 are H, wherein said process is carried out in the substantial absence of elemental iodine.

8) US 4,877,911

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula ##STR9## wherein R.sup.4, R.sup.5, R.sup.6, and R.sup.7, independently, are substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction, provided that R.sup.5, R.sup.6 and R.sup.7 are each other than H, in the presence of

an alkyl halide,

a Lewis acid, and

a phase transfer agent.

9) US 4,877,910

1. A process for producing a polyalkyl tetrahydronaphthalene compound comprising contacting a partially substituted benzene compound, wherein said benzene compound is substituted with two or more substituents that do not substantially interfere with a *Friedel-Crafts-type* alkylation reaction said substituents including at least one secondary alkyl group having only one alpha-hydrogen, and wherein said benzene compound is unsubstituted in at least one position adjacent to said secondary alkyl group, with an olefinic compound of the Formula ##STR16## in the presence of a reagent of the Formula ##STR17## provided that said reagent has greater electron releasing properties than said olefinic compounds,

an alkyl halide or a hydrogen halide, and

a Lewis acid, wherein

R.sup.4, R.sup.5, R.sup.6, R.sup.7, R.sup.8, R.sup.9, R.sup.10, R.sup.11 and R.sup.12, independently, are substituents that do not substantially interfere with a Friedel-Crafts-type alkylation reaction, provided that

(i) R.sup.5 and R.sup.6 are each other than H,

(ii) no more than one of R.sup.7, R.sup.8 and R.sup.9 are H, and

(iii) no more than one of R.sup.10, R.sup.11 and R.sup.12 are H, wherein said process is carried out in the substantial absence of elemental iodine.

10) US 4,849,190

9. The process for making aluminum hydroxide according to claim 1 where the acid liquid waste contains waste products from Friedel-Crafts type reactions resulting from washing the products from the Friedel-Crafts type reaction with water to remove the catalyst of the Friedel-Crafts type reaction.

11) US 4,794,069

8. A process of preparing the compound of claim 1 which comprises subjecting a compound of the formula (II) ##STR49## wherein R.sup.1, R.sup.2, R.sup.3, R.sup.4, R.sup.5, R.sup.6, R.sup.7, R.sup.8, R.sup.9 and R.sup.10 are defined as defined in the formula (I), to dehydrogenation ring closure by the action of Friedel-Crafts type catalysts.

12) US 4,777,288

1. A process for preparing 4-(3,4-dichlorophenyl)-4-phenylbutanoic acid, which comprises the steps of:

(a) subjecting 4-(3,4-dichlorophenyl)-4-keto-butanoic acid to the selective action of a carbonyl reducing agent in a polar protic or an aprotic solvent at a temperature of from about 0.degree. C. to about 100.degree. C. until the reduction reaction to form the desired 4-(3,4-dichlorophenyl)-4-hydroxybutanoic acid intermediate is substantially complete;

(b) converting the intermediate hydroxy acid formed in step (a) to 5-(3,4-dichlorophenyl)-dihydro-2(3H)-furanone; and

(c) thereafter reacting the resulting gamma-butyrolactone compound formed in step (b) with benzene in an excess of said reagent as solvent or in a reaction-inert organic solvent in the presence of a Friedel-Crafts type catalyst at a temperature of from about 0.degree. C. to about

100.degree. C. until the alkylation of benzene by the aforesaid gamma-lactone compound to form the desired 4-(3,4-dichlorophenyl)-4-phenylbutanoic acid is substantially complete

13) US 4,443,353

1. An aqueous bleaching agent having increased viscosity and having cleaning action composed of an alkali metal hypochlorite, at least one surfactant and an alkali metal hydroxide wherein 0.1 to 30 grams of said surfactant are present per 100 grams of said alkali metal hypochlorite and said surfactant is selected from compounds having the general formula $R-(OCH_2)_xCOOM$, wherein said formula R represents an alkyl group having from 8 to 18 carbon atoms, x is a number representing a narrow distribution of the average number of oxyethylene units and having an average value of 0.5 to 8 and M represents an alkali metal atom, wherein said compounds having a narrow distribution of the average number of oxyethylene units are derived from an ethoxylated alcohol obtained by reacting an alcohol with ethylene oxide under the influence of a *Friedel-Crafts type* acid catalyst, said alcohol having the formula ROH wherein R represents an alkyl group having from 8 to 18 carbon atoms.

14) US 4,439,610

1. A process for preparing a triarylmethane derivative having the structural formula ##STR212## wherein each R.sub.1 and R.sub.2 represents at least one of hydrogen, halogen, nitro group, alkyl group, amino group, alkyl-, benzyl-, phenyl-, tolyl-, or pentylene-substituted amino group, hydroxyl group, alkyl-substituted hydroxyl group, thiohydroxyl group or alkyl-substituted thiohydroxyl group, each R.sub.3 and R.sub.4 represents hydrogen, cyano-, hydroxyl-, halogen-, methoxy-, ethoxy-, or ethoxycarbonyl-substituted or unsubstituted alkyl group, cycloalkyl group, alkyl-substituted or unsubstituted aralkyl group, aryl group, or unsaturated alkyl group, or one or both of R.sub.3 and R.sub.4 together with the adjacent nitrogen atom may form a morpholine ring, a pyrrolidine ring, a pyrazolidine ring, a piperidine ring, an imidazoline ring, a piperazine ring, or a pyrimidine ring, R.sub.5 represents at least one of hydrogen, halogen, alkyl group, nitro group, lower alkyl-substituted or unsubstituted amino group, lower alkyl-substituted or unsubstituted thiohydroxyl group, R.sub.6 represents at least one of hydrogen, halogen, lower alkyl group, lower alkoxyl group, amino group, lower alkylamino group, nitro group, phenyl group or phenoxy group, R.sub.7 represents hydrogen, alkyl group, aralkyl group or phenyl group, R.sub.8 represents an alkyl group or alkyl-, halogen-, or alkoxy-substituted or unsubstituted phenyl group which comprises oxidizing a triarylmethane derivative having the structural formula ##STR213## wherein R.sub.1, R.sub.2, R.sub.3, R.sub.4, R.sub.5, R.sub.6, R.sub.7 and R.sub.8 are the same as described hereinbefore, said triarylmethane derivative having the structural formula (I) or (II) being obtained by the reaction of 3-phenylphthalide having the structural formula ##STR214## wherein R.sub.1 and R.sub.2 are the same as described hereinbefore with the aniline derivative having the structural formula ##STR215## wherein R.sub.3, R.sub.4 and R.sub.5 are the same as described hereinbefore, or with the indole derivative having the structural formula ##STR216##

wherein R.sub.6, R.sub.7 and R.sub.8 are the same as described hereinbefore in the presence of a Friedel-Crafts type catalyst.

15) US 4,312,811

6. Process according to claim 1, 2, 3 or 4, wherein said dehydrochlorinating is carried out in the presence of a catalyst of the Friedel-Crafts type.

16) US 4,220,740

9. A process according to claim 1 or 2, wherein the Lewis acid is a Friedel-Crafts type compound or a complex salt compound.

17) US 4,205,145

2. A process for the preparation of a resin for printing inks, comprising the steps of:

reacting (A) a conjugated double bond-containing five-membered cyclic compound represented by the following formula ##STR3## wherein H is hydrogen, R is an organic residue having 1-24 carbon atoms, X is halogen, and l, m and n are each an integer of 0-6 with the total thereof being 6, or a Diels-Alder reaction product thereof, with (B) a phenolic compound in a ratio by weight of from 60:40 to 95:5 in the presence of a Friedel-Crafts type catalyst at -30.degree. to 60.degree. C. for 10 minutes-20 hours to produce a resin,

addition reacting the thus produced resin with (C) an unsaturated carboxylic acid in an amount by weight of 2-20 parts per 100 parts by weight of the resin at 150.degree.-250.degree. C. for 30 minutes-7 hours to produce an acid-modified resin and then

reacting the thus produced acid-modified resin with (D) a resol-type phenol resin in an amount by weight of 5-40 parts per 100 parts by weight of the acid-modified resin at 160.degree.-300.degree. C. for 30 minutes-15 hours, the resol-type phenol resin (D) being obtained by reacting with formaldehyde in the presence of a basic catalyst phenol or an alkyl-substituted phenol selected from the group consisting of cresol, ethylphenol, isopropylphenol, tert.-butylphenol, tert.-octylphenol and nonylphenol, thereby to prepare the resin for printing inks

18) US 4,181,791

1. A process for preparing a curable resin containing phenolic groups, which comprises reacting

(1) an aralkylene ester of formula $R'(\text{CH}_2\text{OYR}')_{\text{sub.a}}$, wherein R' is a radical selected from the group consisting of divalent or trivalent aromatic hydrocarbyl groups and aromatic

hydrocarbyl-oxy-aromatic hydrocarbyloxy groups, each of which may be substituted with at least one substituent selected from the group consisting of alkyl of 1-4 carbon atoms, halogen atoms and a phenyl group, R.sub.1 is a radical selected from the group consisting of alkyl groups of 1 to 6 carbon atoms and aryl groups of 6-13 carbon atoms, Y is a radical selected from the group consisting of carbonyl and sulphonyl groups, and a is 2 or 3, with

(2) a molar excess of a phenolic component which also may be substituted by non-hydroxylic substituents which are inert under the reaction conditions,

said reaction being carried out in the presence of a catalyst for condensation of ester groups with nuclear hydrogen atoms in the phenolic compound, said catalyst being selected from Friedel Crafts type catalysts, and dialkyl sulphates with 1-6 carbon atoms in each alkyl group, at a temperature between 100.degree. and 200.degree. C.

19) US 4,127,710

1. A method comprising:

copolymerizing a 1,3-cyclodiene comonomer and a linear conjugated diene comonomer in the presence of a catalyst formed from a mixture comprising

(a) a triorganoaluminum compound represented by the general formula R.sub.3 "Al wherein R" is a hydrocarbon radical containing from 1 to 20 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, aralkyl, and mixtures thereof;

(b) a nickel (II) compound; and

(c) a Friedel-Crafts type Lewis acid cocatalyst wherein the amount of the triorganoaluminum compound is in the range of from about 0.5 to 30 moles per mole of the nickel (II) compound, the amount of the Friedel-Crafts type cocatalyst is in the range of from about 0.5 to 30 moles per mole of the nickel (II) compound, and the amount of nickel (II) compound is in the range of from about 0.05 to 50 millimoles per hundred grams of total comonomer.

20) US 4,127,490

1. A textile treating composition consisting essentially of a mixture of (1) a major amount of a lubricant and (2) a minor effective amount of stabilizer sufficient to prevent oxidative degradation of said lubricant upon exposure to heat said stabilizer a reaction product formed by reacting, in the presence of Friedel-Crafts type catalyst, one mole of dicyclopentadiene and at least one mole of p-cresol, and further reacting said reaction product with at least one half mole of isobutylene.

21) US 4,107,144

1. A dialkylphenol antioxidant having attached to the phenol in the 4 or 6 position on the ring a vinylic polymer tail of molecular weight from about 1000 to about 5000 as determined by vapor pressure osmometry or by gel permeation chromatography, said vinylic polymer being in the form of a pendant chain attached to said ring at one end of the chain derived from vinyl monomers which polymerize cationically with an acid catalyst of the Lewis Acid or Friedel-Crafts type.

22) US 4,056,513

1. Process for the preparation of terpene-phenol resins by reaction of a carene with a phenol in the presence of an acidic condensation catalyst, comprising:

a. reacting at a temperature of 80.degree.-120.degree. C one molar proportion of a phenol having at least two reactive sites with 0.4-0.6 molar proportion of a carene, in the presence of an acidic condensation catalyst selected from a Lewis acid type catalyst and a Friedel-Crafts type catalyst:

b. reacting at a temperature of 80.degree.-120.degree. C the reaction product from step (a) with 0.4-0.6 molar proportion of said carene, in the presence of said catalyst, said carene being added in steps (a) and (b) at a temperature of 20.degree.-100.degree. C; and

c. subsequently reacting at a temperature of 80.degree.-120.degree. C the product from step (b) with a reactive terpene, the molar ratio of reactive terpene to amount of carene added in step (b) being comprised within the range from 0.5 to 5; steps (a)-(c) being carried out under an inert gaseous atmosphere and in the presence of an aromatic hydrocarbon solvent; thereby obtaining a terpene-phenol resin of clear stable color having a Ring and Ball melting point range of 95.degree.-98.degree. C.

23) US 4,045,458

1. A process for preparing a triarylmethane derivative having the general formula: ##STR211## wherein each R.sub.1 and R.sub.2 represents at least one of hydrogen, halogen, a nitro group, an alkyl group, a substituted alkyl group, an amino group, a substituted amino group, a hydroxyl group, a substituted hydroxyl group, a thiohydroxyl group or a substituted thiohydroxyl group, each R.sub.3 and R.sub.4 represents hydrogen, a substituted or unsubstituted alkyl group, a cycloalkyl group, a substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or a substituted unsaturated alkyl group, R.sub.5 represents at least one of hydrogen, halogen, an alkyl group, a nitro group, a substituted or unsubstituted amino, group, substituted or unsubstituted hydroxyl group, or a substituted or unsubstituted thiohydroxyl group which comprises reacting a 3-phenylphthalide derivative having the general formula: ##STR212## wherein R.sub.1 and R.sub.2 are the same as described hereinabove, with an aniline derivative having the general formula: ##STR213## wherein R.sub.3, R.sub.4 and R.sub.5 are the same as

hereinabove defined, in the presence of a *Friedel-Crafts type* catalyst.

24) US 4,035,495

24. The process for preparing a compound of claim 1, comprising:

condensing a compound of the formula 2 ##STR28## in which R.sup.1 is as defined therein and X.sup.1 is hydroxy, mercapto, --S--SO.sub.3 --Na or --S--So.sub.3 -K with a compound of formula ##STR29## wherein R.sup.3 is lower alkyl, n is an integer from zero to two and A is COOR.sup.6 in which R.sup.6 is hydrogen or lower alkyl, in the presence of a *Friedel-Crafts type* catalyst to obtain the corresponding compound of formula 3 ##STR30## in which R.sup.1, R.sup.3, n and A are defined hereinabove, X is oxy or thio and R.sup.2 is hydrogen; subjecting said compound of formula 3 to hydrolysis to the corresponding acid in the case where R.sup.6 is lower alkyl; subjecting the acid compound to amidation with an appropriate amine for formula NHR.sup.4 R.sup.5 in which R.sup.4 and R.sup.5 are as defined in claim 1 to give the amide and reducing the amide with a suitable complex metal hydride to give the corresponding compound of formula 1, wherein the compound having the formula ##STR31## is added to a mixture of the compound of formula 2 and the *Friedel-Crafts type* catalyst.

25) US 4,035,495

24. The process for preparing a compound of claim 1, comprising:

condensing a compound of the formula 2 ##STR28## in which R.sup.1 is as defined therein and X.sup.1 is hydroxy, mercapto, --S--SO.sub.3 --Na or --S--So.sub.3 -K with a compound of formula ##STR29## wherein R.sup.3 is lower alkyl, n is an integer from zero to two and A is COOR.sup.6 in which R.sup.6 is hydrogen or lower alkyl, in the presence of a *Friedel-Crafts type* catalyst to obtain the corresponding compound of formula 3 ##STR30## in which R.sup.1, R.sup.3, n and A are defined hereinabove, X is oxy or thio and R.sup.2 is hydrogen; subjecting said compound of formula 3 to hydrolysis to the corresponding acid in the case where R.sup.6 is lower alkyl; subjecting the acid compound to amidation with an appropriate amine for formula NHR.sup.4 R.sup.5 in which R.sup.4 and R.sup.5 are as defined in claim 1 to give the amide and reducing the amide with a suitable complex metal hydride to give the corresponding compound of formula 1, wherein the compound having the formula ##STR31## is added to a mixture of the compound of formula 2 and the *Friedel-Crafts type* catalyst.

26) US 4,020,260

1. A hydrocarbon resin having a softening point of from about 100.degree. to about 160.degree. C and being substantially gel-free comprising about

95-35% by weight of units derived from 1,3-pentadiene,

1-50% by weight of units derived from 1,5,9-cyclododecatriene, and

0-40% by weight of units derived from at least one monoolefin containing 5 carbon atoms, said resin obtained by polymerizing a monomeric mixture comprising about

95-35% by weight of 1,3-pentadiene,

1-50% by weight of 1,5,9-cyclododecatriene, and

0-50% by weight of at least one monoolefin containing 5 carbon atoms,

in the presence of a solvent containing at least 50% by weight of an aromatic hydrocarbon and about 0.1-5 parts by weight, per 100 parts by weight of the monomeric mixture of a Friedel-Crafts type metal halide catalyst selected from aluminum halide and boron trifluoride.

27) US 3,997,706

1. A process for the chloromethylation of styrene-divinylbenzene copolymers by using a methylating agent, a chlorine donor and a catalyst, characterized in that the copolymer to be chloromethylated is treated in either the presence or absence of swelling agents, and of inert dispersants, with a mixture of methylal and thionyl chloride in the presence of a Friedel-Crafts type catalyst or of a catalyst consisting of an acid, the methylal/thionyl chloride ratio being comprised between 0.5:1 and 2:1.

28) US 3,956,357

8. A process as claimed in claim 1 wherein the condensation catalyst is a Friedel-Crafts type catalyst.

29) US 3,954,897

1. A process for preparing a colorless, odorless and transparent polymer oil having a low number average molecular weight of 300 - 1000, low iodine value and low viscosity and a high flash point, comprising copolymerizing 20 - 90% by weight of n-pentene-1 and 80 - 10% by weight of at least one other chain pentene in the presence of a Friedel-Crafts type catalyst selected from the group consisting of halides of aluminum, iron, tin and boron, at a temperature of from -50.degree. to 150.degree. C and a gauge pressure of from 0 to 50 kg/cm.sup.2 for 10 minutes to 10 hours thereby to produce a liquid polymer having a number average molecular weight of 300 - 1000 and then catalytically hydrogenating the thus produced liquid polymer at a temperature of from room temperature to a temperature below the temperature at which the liquid polymer commences its thermal degradation, at a pressure ranging from normal atmospheric pressure to 300 atm. for about 10 minutes to about 20 hours to an extent that the hydrogenated liquid polymer has an iodine value of not more than 10, thereby obtaining the desired polymer oil.

30) US 3,950,453

1. In a process for producing a petroleum resin by providing a starting oil composition comprising chain conjugated diolefins having 4 to 5 carbon atoms and monoolefinic unsaturated hydrocarbons having 4 to 10 carbon atoms and being copolymerizable with said conjugated diolefin and cationically polymerizing the starting oil composition in the presence of a Friedel-Crafts type catalyst,

said process comprising the steps of:

providing (I) a first feed portion comprising at least one of the chain conjugated diolefins and at least one of the monoolefinic unsaturated hydrocarbons in a proportion of from 20 to 80% by weight of the monomers contained in the first portion and (II) a second feed portion comprising at least one of the chain conjugated diolefins and, if desired, at least one of the monoolefinic unsaturated hydrocarbons in a proportion, which is less than said proportion in the first feed portion, by weight of the monomers contained in the second feed portion, the starting oil composition consisting essentially of the first and second feed portions (I) and (II),

polymerizing the first feed portion (I) in a first step and

successively polymerizing in a second step the second feed portion (II) in the presence of the resulting reaction mixture from the first step, thereby obtaining a petroleum resin having a low melt viscosity and satisfactory compatibility.

31) US 3,942,997

4. A paint composition according to claim 1, in which the liquid polymer is the product of the copolymerization of the 1,3-pentadiene and the 1,3-butadiene in the presence of a homogeneous Friedel-Crafts type catalyst.

32) US 3,935,140

1. An aqueous coating composition comprising a water soluble or dispersible material prepared by addition reacting a mixture containing (1) 90-50 parts by weight of a natural drying oil and (2) 10-50 parts by weight of a liquid copolymer having a number average molecular weight of from 500 to 5000 and containing 90-50% by weight of 1,3-pentadiene polymerization units and 10-50% by weight of 1,3-butadiene polymerization units, the liquid copolymer being obtained by polymerizing a corresponding monomeric mixture of 1,3-pentadiene and 1,3-butadiene in the presence of a Friedel-Crafts type catalyst, with at least one .alpha.,.beta.-unsaturated dicarboxylic compound represented by the following general formula ##EQU2## wherein R and R' are each a hydrogen atom, halogen atom or alkyl group, and A and B are each a hydroxyl

group, alkoxy group or --O-- together formed by A and B with the proviso that A and B do not take an alkoxy group at the same time, thereby to form an addition product which is then neutralized to make it soluble or dispersible in water.

33) US 4,036,842 1. A process for preparing a polycyclic heterocycle compound having a pyran ring which comprises reacting in the presence of a Friedel Crafts type catalyst a compound of the formula II:

wherein B is ##STR80## with a compound of the formula III: ##STR81## in which L and M each represent lower alkoxy or together represent the ethylenedioxy radical or oxo, and wherein R.sup.1 is hydrogen, lower alkyl, phenyl or p-halophenyl, and R.sup.2 is 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl; or R.sup.2 is ##STR82## wherein R.sup.7 and R.sup.8 are the same or different and each represent halo, hydroxyl, carboxyl, carb(lower)alkoxy, or R.sup.1 and R.sup.2 together with the carbon atoms to which they are both joined to form a radical of the formula ##STR83## in which R.sup.6 is lower alkyl.

34) US 3,893,986

1. A process for the preparation of hydrocarbon solvent-soluble hydrocarbon resins, characterized by polymerizing a monomeric mixture comprising 35 - 85 percent by weight of 1,3-pentadiene, 5 - 30 percent by weight of cyclopentene and 10 - 50 percent by weight of diisobutylene, in the presence of a Friedel-Crafts type acidic metal halide catalyst.

35) US 3,886,207

1. A process for producing a compound of the general formula ##SPC10##

wherein X represents a halogen atom, and n is 1 or 2, or pharmaceutically acceptable salts thereof, which comprises reacting a compound of the general formula: ##SPC11##

wherein X is as defined above, with a compound of the general formula: ##SPC12##

wherein n is as defined above, and A represents --CH=CH-- or ##SPC13##

and wherein Y represents a halogen atom, hydroxyl group or sulfonic acid residue of the formula --OSO.sub.2 --R, wherein R represents a lower alkyl group having up to 4 carbon atoms, phenyl or a phenyl substituted by a lower alkyl group, in the presence of a Friedel-Crafts type catalyst or an

36) US 3,884,712

1. A process for preparing a liquid polymer having an average molecular weight of 300-10,000 and an iodine number of at least 250 and being capable of forming hydrocarbon solvent-insoluble

coatings, comprising copolymerizing a monomeric mixture containing 90-50% by weight of 1,3-pentadiene and 10-50% by weight of 1,3-butadiene in the presence of a homogenizable Friedel-Crafts type catalyst selected from the group consisting of boron trifluoride and complexes thereof, tin tetrachloride, ferric chloride, titanium tetrachloride, solubilized aluminum chloride, alkylaluminum dichloride, sulphuric acid and hydrogen fluoride.

37) US 3,886,110

1. An aqueous coating composition comprising a water-soluble or water-dispersible copolymer prepared by addition reacting with at least one .alpha.,.beta.-unsaturated dicarboxylic compound a liquid copolymer comprising 90-50% by weight of 1,3-pentadiene units and 10-50% by weight of 1,3-butadiene units and having an average molecular weight of 500-5,000, the liquid copolymer having been prepared by the copolymerization of 1,3-pentadiene and 1,3-butadiene in the presence of a Friedel-Crafts type catalyst, and neutralization of the thus-obtained modified copolymer to make it soluble or dispersible in water.

38) US 4,181,791

1. A process for preparing a curable resin containing phenolic groups, which comprises reacting

(1) an aralkylene ester of formula $R'(CH_2)_nOYR''$, wherein R' is a radical selected from the group consisting of divalent or trivalent aromatic hydrocarbyl groups and aromatic hydrocarbyl-oxy-aromatic hydrocarbyloxy groups, each of which may be substituted with at least one substituent selected from the group consisting of alkyl of 1-4 carbon atoms, halogen atoms and a phenyl group, R'' is a radical selected from the group consisting of alkyl groups of 1 to 6 carbon atoms and aryl groups of 6-13 carbon atoms, Y is a radical selected from the group consisting of carbonyl and sulphonyl groups, and n is 2 or 3, with

(2) a molar excess of a phenolic component which also may be substituted by non-hydroxylic substituents which are inert under the reaction conditions,

said reaction being carried out in the presence of a catalyst for condensation of ester groups with nuclear hydrogen atoms in the phenolic compound, said catalyst being selected from Friedel-Crafts type catalysts, and dialkyl sulphates with 1-6 carbon atoms in each alkyl group, at a temperature between 100.degree. and 200.degree. C.

39) US 3,929,736

1. A process for preparing a resin suitable for printing ink use which comprises using as the starting oil to be polymerized a mixture selected from the group consisting of a reaction mixture obtained by heating at a temperature of 100.degree. - 300.degree.C. that fraction containing diolefins of 5 carbon atoms and of a boiling point in the range of 20.degree. - 80.degree.C. of the thermally cracked product oil of petroleum fractions and a mixture of said reaction mixture with that fraction of a boiling point in the range of 140.degree. - 280.degree.C. of the thermally cracked product oil of petroleum fractions, polymerizing said selected mixture in the presence of

a Friedel-Crafts type catalyst, and thereafter reacting the resulting thermoplastic resin with a compound selected from the group consisting of the unsaturated carboxylic acids and the anhydrides thereof, said compound being used in an amount of 0.01 - 0.2 mole per 100 grams of said thermoplastic resin, thereby forming a resin which is soluble in a nonaromatic hydrocarbon solvent and having a softening point of above 100.degree.C.

40) US 3,887,633

1. A process for preparing a polymer oil of pour point of not higher than -30.degree.C, a flash point of not lower than 180.degree.C, a specific gravity of 0.92 - 0.94, an acid value of not more than 0.02mgKOH/g, a saponification value of not more than 0.02mgKOH/g, a Hazen number of not more than 50, a number average molecular weight of 300 - 1,000, and an iodine number of not more than 60 comprising the steps of:

polymerizing a monomer containing at least 80 percent of 1,3-pentadiene at temperatures of from -30.degree.C to 100.degree.C in the presence of a homogenizable Friedel-Crafts type catalyst to produce a liquid polymer having a number average molecular weight of 300 - 1,000 and an iodine number of not less than 250 wherein at least 70 percent of the pentadiene units is of trans structure, and then hydrogenating the thus-produced liquid polymer to the extent that its iodine number is decreased to not more than 60 as determined by Wijs method, thereby obtaining said polymer

41) US 3,880,807

2. The method of producing a rubber tackifier and stabilizer resin which comprises reacting 5 to 50 parts by weight of furfuraldehyde and 100 parts by weight of tire pyrolysis oil obtained by distillation of vulcanized tire scrap at a temperature in the range of 1000.degree. to 2500.degree. F., at a temperature of -25.degree. to 250.degree. C. in the presence of a catalyst of the class consisting of sulfuric acid, p-toluene-sulfonic acid, the sulfur- and phosphorous-bridging condensation type catalysts and Friedel-Crafts type catalysts, which oil has the following analysis (volume percent):

42) US 3,862,024

1. A process for increasing the viscosity index of a petroleum hydrocarbon lubricating oil base stock having a viscosity within the range of 35 to 100 SUS at 210.degree.F. and an original viscosity index of about 50 to 95 which comprises the steps of halogenating the said base stock to the extent of from 0.1 to 1 atom of halogen per average molecule of said base stock, and thereafter reacting the halogenated base stock with from 20 to 200 wt. percent of linear alpha olefin of from 2 to 40 carbon atoms in the presence of an alkylation catalyst of the Friedel-Crafts type.

43) US 3,714,264

1. An alkylation reaction product prepared by alkylating 4(methylthio)phenol with an olefin selected from the group consisting of

2-methyl-1-propene

2-methyl-1-butene

2-methyl-2-butene

2-methyl-1-pentene

2-methyl-2-pentene

3-methyl-2-pentene

2-methyl-1-hexene

2-methyl-2-hexene'

3-methyl-2-hexene

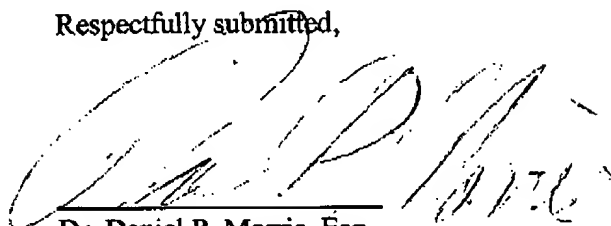
3-methyl-3-hexene and

2,4,4-trimethyl-1-pentene,

wherein the alkylation occurs at a temperature of from 20.degree. C. to 150.degree. C. in the presence of a Friedel Crafts type catalyst, at least one mol of olefin being charged per mol of 4(methylthio) phenol.

Please charge any fee necessary to enter this paper and any previous paper to deposit account 09-0468.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'D. P. Morris', is written over a horizontal line.

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